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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

04-AMCP-0368

JUL 22 2004

Mr. Nicholas Ceto, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

RECEIVED
AUG 24 2004
EDMC

Dear Mr. Ceto:

ESTABLISH HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
(TRI-PARTY AGREEMENT) UNDER THE M-016 SERIES TO ADDRESS
GROUNDWATER CONTAMINATION IN THE 300-FF-5 OPERABLE UNIT (OU)

Attached for your review and approval is the Tri-Party Agreement Change Package M-016-04-05. This Class II Tri-Party Agreement change package proposes the establishment of a new Tri-Party Agreement Interim Milestone under the M-016 series milestones. The proposed milestone addresses groundwater contamination in the 300-FF-5 OU.

The attenuation of the 300-FF-5 OU uranium plume is significantly slower than the estimated attenuation rate that formed the basis for the July 1996 Record of Decision (ROD) identifying natural attenuation and continued groundwater monitoring as the remedial action. The Remedial Investigation/Feasibility Study predicted that the remedial action objectives would be achieved in 3 to 10 years (from late 1993). Source-removal actions for the primary liquid waste disposal facilities have been completed and the cleanup of remaining waste sites and burial grounds will be ongoing for the next decade. In addition, emerging issues not addressed in the 1996 ROD, such as the tritium plume at the 618-11 burial ground and the uranium plume at the 316-4 crib, need an updated Feasibility Study to support a remedy decision as well. Finally, the conceptual model for uranium transport has been enhanced significantly since the 1996 ROD was issued, providing a more reliable basis for assessing passive and active remedial alternatives. Therefore, the Tri-Parties have agreed to reevaluate the natural attenuation remedy and assess the potential for active and passive remedial measures to achieve remedial action goals identified in the July 1996 ROD – restoration of the aquifer to drinking water standards within a reasonable timeframe.

The attached Tri-Party Agreement change package was developed by Mike Goldstein, EPA, and Mike Thompson, RL. The Tri-Party Agreement Action Plan, Section 12.0, "Changes to the Agreement," prescribes that the Tri-Parties have 14 days following receipt of a signed change package to act on the change package.


Mr. Nicholas Ceto
04-AMCP-0368

-2-

JUL 22 2004

If you have questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971, or Joel Hebdon, Director, Office of Environmental Services, on (509) 376-6657.

Sincerely,



for Keith A. Klein
Manager

AMCP:KMT

Attachment

cc w/o attach:

D. Bartus, EPA

L. D. Crass, FHI

L. J. Cusack, Ecology

B. H. Ford, FHI

S. Harris, CTUIR

J. S. Hertz, FHI

R. Jim, YN

T. Martin, HAB

E. J. Murphy-Fitch, FHI

K. Niles, ODOE

P. Sobotta, NPT

M. A. Wilson, Ecology

Administrative Record (H6-08)

M-16-XX-XX

Change Control Form

Do not use blue ink. Type or print using black ink.

June 30, 2004

Originator: K. A. Klein

DRAFT 1009 376-7395

Class of Change:

☐ I - Signatories☒ II - Executive Manager☐ III - Project Manager

Change Title:

Establish Tri-Party Agreement Interim Milestones under the M-016 series milestones to address groundwater contamination in the 300-FF-5 Operable Unit

Description/Justification of Change:

The attenuation of the 300-FF-5 Operable Unit uranium plume is significantly slower than the estimated attenuation rate that formed the basis for the July 1996 Record of Decision (ROD) identifying natural attenuation and continued groundwater monitoring as the remedial action. The Remedial Investigation/Feasibility Study predicted that the remedial action objectives would be achieved in 3 to 10 years (from late 1993). Source-removal actions for the primary liquid waste disposal facilities have been completed and the cleanup of remaining waste sites and burial grounds will be ongoing for the next decade. In addition, emerging issues not addressed in the 1996 ROD, such as the tritium plume at the 618-11 burial ground and the uranium plume at the 316-4 crib, need an updated Feasibility Study to support a remedy decision as well. Finally, the conceptual model for uranium transport has been enhanced significantly since the 1996 ROD was issued, providing a more reliable basis for assessing passive and active remedial alternatives. Therefore, the Tri-Parties have agreed to reevaluate the natural attenuation remedy and assess the potential for active and passive remedial measures to achieve remedial action goals identified in the July 1996 ROD -- restoration of the aquifer to drinking water standards within a reasonable timeframe.

A Focused Feasibility Study (FFS) will be completed to evaluate technical alternatives and a Draft Proposed Plan (PP) will be submitted with the recommended path forward to achieve the remedial action goals identified in the July 1996 ROD -- restoration of the aquifer to drinking water standards within a site-specific reasonable timeframe. If appropriate, a Treatability Investigation Workplan will be submitted (as a primary document under the TPA) with a schedule for revising the FFS/PP, reflecting the time necessary to complete the workplan activity. If a Treatability test is required, a new milestone for delivery of an updated FFS and PP will be negotiated to accommodate the test and assessment of its results.

The FFS/PP will be coordinated with ongoing Columbia River risk assessment activities. Additional analysis may be necessary to evaluate technologies for further reducing the flux of risk-driving contaminants to the Columbia River and its riparian habitat.

The FFS/PP will provide data necessary to support the evaluation of technical impracticability waivers and alternate concentration limits as provided under CERCLA for portions of (or the entire) aquifer if restoration to drinking water standards within a reasonable time frame cannot be achieved.

The proposed change is aligned with M-016-00B major milestone, *Complete All Interim Response Actions for the 300 Areas* due September 30, 2018.

Modifications established by approval of this Tri-Party Agreement Change Request are denoted as ~~strikeout~~ for deletions/modification and shading for new text.

Milestone	Description	Date
M-016-XX	Submit a Draft Focused Feasibility Study/ Proposed Plan for the 300-FF-5 Operable Unit that reevaluates the natural attenuation remedy, assesses the potential for active and passive remedial measures to achieve remedial action goals identified in the July 1996 ROD -- restoration of the aquifer to drinking water standards within a reasonable timeframe, provides data necessary to support the evaluation of technical impracticability waivers and alternate concentration limits as provided under CERCLA for portions of (or the entire) aquifer if restoration to drinking water standards within a reasonable time frame cannot be achieved. If appropriate, a Treatability Investigation Workplan will be submitted (as a primary document under the TPA) with a schedule for revising the Focused Feasibility Study and Proposed Plan reflecting the time necessary to complete the workplan activity. If a Treatability test is required, a new milestone for delivery of an updated FFS and PP will be negotiated to accommodate the test and assessment of its results.	03/31/2005

May 28, 2004
Draft

**STATEMENT OF WORK,
FOCUSED FEASIBILITY STUDY/PRE-DESIGN
REMEDY FOR THE AREA OF THE URANIUM PLUME (INCLUDING OTHER
CONTAMINANTS OF CONCERN IN THE SAME AREA) AT GROUNDWATER
OPERABLE UNIT 300-FF-5**

1. Purpose

The Department of Energy has requested Pacific Northwest National Laboratory to complete the work described in this Statement of Work (SOW) in order to provide a technical basis for selection of a remedy for groundwater contamination in the 300-FF-5 Operable Unit. Once implemented, the remedy in conjunction with other actions outside of this SOW, such as, surface and near-surface source removal actions, will reduce the groundwater contamination concentrations in the operable unit.

The geographical scope of this SOW is the groundwater beneath the 300 Area and involves uranium contamination as well as the other contaminants of concern in the uranium plume area. Groundwater in other regions of the 300-FF-5 OU, particularly those beneath the 618-10 and 618-11 Burial Grounds and the 316-4 Cribs, will be addressed by separate SOW involving the 300-FF-5 Focused Feasibility Study. The work described in this SOW is focused on restoration of the aquifer to its highest beneficial use, which is presumed to be as a drinking water supply.

Both of the work products resulting from this statement of work and from the statement of work for the other regions of the 300-FF-5 Operable Unit will be reported jointly in the Draft FFS to be delivered on March 31, 2005.

2. Background of the 300-FF-5 Operable Unit

The scope of this work will differ from the typical Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) paradigm of a feasibility study (FS) as outlined in 40 CFR 300.430(e) because a Record-of-Decision (ROD) has already been established for interim remedial actions (EPA 1996 and EPA 2000). The following tasks, which would typically be completed in conjunction with an FS, have already been completed for the operable unit:

- Extensive site characterization, with notable milestones being the Remedial Investigation/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).

- Baseline risk assessment, as reported in the Remedial Investigation/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).
- Screening of a wide variety of remedial action technologies, Phase I and II Feasibility Study Report for the 300-FF-5 Operable Unit (DOE-RL-93-22), assembling of remedial alternatives, and detailed analysis of remedial alternatives, Remedial Investigations/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).
- Consideration of applicable or relevant and appropriate requirements (ARARs), Remedial Action Objectives (RAOs) and Preliminary Remediation Goals (PRGs) presented in DOE-RL-94-85.
- Selection of an interim action remedy in the ROD (EPA, 1996; modified by an Explanation of Significant Difference in June 2000 to include the groundwater beneath the 618-10, 618-11, 316-4, 600-63, and 600-259 sites).

Additional remedial action and contaminant characterization activities have occurred since the initial RI/FS process was conducted. These activities have a strong influence on the outcome of revisiting the focused feasibility study. These activities include:

- Extensive removal of contaminated soils from waste sites; backfilling of these waste sites and stabilization of the ground surface.
- Investigations into the geochemistry of uranium, especially the leachability characteristics in the soils directly related to the waste sites (Serne et al. 2002), and to the underlying vadose zone and capillary fringe into which uranium may have migrated (Zachara et al. 2004, in progress).
- Detailed field investigations into the distribution of uranium in the shoreline and riverbed environment, including pore water, sediment, and biota (Patton et al. 2002).

3. Task Elements

Task 1 – Update of 300-FF-5 Conceptual Model (Peterson, Lindberg)

- Review 1994 RI and 1995 RI/FS and the information/data used in the formulation of conceptual model presented in the reports
- Summarize and interpret groundwater, surface water, and biological data collected since issuing the 1996 ROD
- Review Cleanup Verification Packages (CVPs) in order to obtain site specific information on post-cleanup soil concentrations and any reported information from post-clean-up trenching

- Review CVPs to evaluate and document how post-cleanup groundwater protectiveness has been demonstrated
- Update the current conceptual site model to provide a more comprehensive description of the natural features and processes that influence the level of contamination.
- Re-evaluate the basis for hydraulic conductivity values used in the 300 Area remedial investigations and feasibility studies and for the modeling efforts of this focused feasibility study.
- Summarize new developments in the S&T program and develop/update the uranium transport/geochemical model
- Incorporate new information from the Ecological Compliance and Monitoring Project on the distribution and transport pathways for uranium at the groundwater/river interface.

Task 2 – Develop Focused List of Approximately 5-7 Alternatives for Detailed Development and Evaluation (Nimmions, Thornton, Navmik, Peterson, Fruchter)

The objectives of this task are to identify, evaluate, and obtain stakeholder consensus for a limited set of remedial technologies that may be effectively deployed to remedy dissolved uranium in groundwater in the 300-FF-5 Operable Unit. A list of five to seven candidate remedial technologies will be assembled during a period not to exceed four months, and examined for further consideration and development during the focused feasibility study.

The identification of candidate technologies will include not only remedial approaches previously described in the 1994 Phase I and II Feasibility Study, but also include consideration of new and developing technologies investigated within the PNNL Science and Technology project, and various technologies deployed at other sites where uranium in groundwater is an issue. This process will follow EPA guidance, i.e., identification, screening, assembling, and evaluating alternatives.

Candidate technologies will be presented in a concise technology summary, which will describe the underlying physical, chemical, or biological mechanism; potential application or delivery systems; application history and development status; potential advantages and disadvantages; and applicability to 300-FF-5 site conditions. The summary will provide information to gain stakeholder consensus prior to proceeding to assembling remedial approaches for screening comparison in the focused feasibility study.

The previous feasibility study evaluation of groundwater remedial alternatives for the uranium plume focused on remedial strategies that control, extract and treat, or dilute the dissolved phase of uranium. The apparent persistence and non-attenuation of dissolved phase uranium over the past half-century, suggests that sorption and desorption phenomena in the unsaturated zone (i.e., vadose zone beneath waste sites) and at the water table interface (i.e., capillary fringe) may, in part, control the persistence of this contamination. Particular emphasis on a better understanding and possible manipulation

or control of the contaminant sources in or near the groundwater interface will be a focus within this task. The simulation and matrix effect capabilities of the local scale model development, as well as the geochemical research conducted by the Science and Technology team, will be incorporated in this task. Previously unconsidered technological approaches will be evaluated in assembling the candidate technology options.

The technical approaches and remedial action alternatives previously considered and screened in the earlier feasibility study efforts (1994 RI and 1995 RI/FS) will be reviewed in conjunction with the sorption related and geochemical stabilization processes considered in this effort. The physical control mechanisms of earlier approaches will be combined with the more recent developments of geochemical sequestration, mobilization and transformation techniques, to include the broadest possible scope of remedial approaches for reducing uranium concentrations in the groundwater and uranium mass flux into the Columbia River. This list of focused alternatives will be based on updates to the conceptual model; new developments within the S&T and other DOE projects and remedial alternatives for uranium that have been used at other sites; and the previous Final FS.

The comprehensive list of remedial approaches will then be screened using the three screening criteria described in the NCP of the nine criteria prescribed in 40 CFR §300.430(f)(1). These three screening criteria: effectiveness, implementability, and cost, will be used to select 5 to 7 *general* remedial approaches that are judged to have the greatest potential for achieving the stated objective at this site.

It should be noted that during the remedy selection process in Tasks 4 and 7, the nine remedy evaluation criteria will be considered in distinct groups that play specific roles in determining the selection of a remedy to satisfy the five principal statutory requirements. The nine evaluation criteria include two "threshold" criteria, five "balancing" criteria (including cost), and two "modifying" criteria (state and community acceptance). The modifying criteria will be considered to the extent possible during the process leading up to and including the Proposed Plan, and will be fully considered after public comments on that plan have been received.

A technical memorandum will document the evaluation process and engineering cost analysis. The technical memorandum will be prepared for stakeholder review by the end of September 2004 with the goal of obtaining consensus as a basis to proceed into follow-up tasks.

Task 3 – Groundwater Flow and Transport Modeling (Navmik, Bergeron)

Groundwater modeling technology will be used to integrate and further advance the thought process of the conceptual model developed in Task 1. The model will be a mathematical representation of the subsurface hydraulics and chemistry as they exist today. It will be used to quantify changes in the geohydrological and chemical conditions in the subsurface resulting from changes in contamination source material and

groundwater levels. As such, this will enable the evaluation of remedial alternatives that may affect the conditions of the existing uranium plume. Modeling is the only tool available that allows for the quantitative comparison of potential remedies. It will form the basis for decision making regarding the proactive clean-up of the uranium plume.

This task will involve development of a local-scale model for the uranium plume beneath the 300 Area based on the (unsaturated-saturated) STOMP code. The STOMP model development effort proposed here will construct a local scale model appropriate for domain, spatial and temporal resolution, flow and transport processes, key sources, and boundary conditions. This development effort will collate and make use of:

- Estimates of hydraulic properties currently developed for the site-wide groundwater flow and transport model
- A database of the areal and vertical extent of major hydrogeologic units, using Earth Vision
- Current methods and approaches that have been developed for directly translating Earth Vision database information to appropriate STOMP model input files
- Current information on estimates of water sources and waste inventory information and data compiled under the System Assessment Capability for key facilities that need to be considered
- Appropriate observed and predicted stage and flow conditions for the Columbia River that will be needed to establish or approximate transient boundary conditions for forward predictions
- Existing estimates of the uranium plume inventories based on interpretation of past and current field observations and measurement needed to estimate initial conditions for forward predictions of remediation alternative performance. (Note: uranium is the primary focus of the baseline risk assessment and focused feasibility study planned for FY 05).

This activity will leverage off of an ongoing research modeling effort based on a very-high resolution STOMP model and data and information from the 300 Area currently supported by the Nuclear Regulatory Commission.

The primary goals of the FY 04 effort are to:

- Complete initial flow simulations with the newly developed STOMP model over a temporal period of interest
- Develop initial collation of available data and information for the existing uranium plume that can be used in development of initial conditions for forward simulations.

Activities for FY 05 include:

- Plan and conduct model simulations designed to comparatively evaluate the hydraulic control mechanisms

- From modeling scenarios derive quantitative hydraulic metrics to be applied to the engineering evaluation of the alternatives

Task 4 – Focused Feasibility Study, Phase 1 (Nimmons, Naymik, Peterson)

- Based on preliminary modeling results and engineering evaluations, prepare a detailed technical description and conceptual layout of the focused alternatives for screening
- Conduct alternatives screening and evaluate potential need for treatability studies

Task 5 – Treatability Studies (TBD)

- Develop Treatability Investigation Work Plan based on needs identified in Task 4 related to potential deployment of emerging remedial technologies at the bench scale to confirm the effectiveness of candidate emerging technologies and provide information needed for engineering design and modeling
- Conduct Selected Treatability Studies
- Complete Treatability Studies Report

Task 6 – Risk Related Activities (Peterson, Poston, Burn)

- Review 1994 RI and 1995 RI/FS and the information/data used in the formulation of the baseline risk assessment
- Consider human health and ecological risks resulting from the implementation of selected remedies for input to Phase 2 of the Focused Feasibility Study.
- Integrate and corroborate all risk assessment activities with the River Corridor Risk Assessment

Task 7 – Focused Feasibility Study, Phase 2 (Nimmons)

- Based on final modeling results and engineering evaluations prepare a detailed technical description and conceptual layout of the final focused alternatives
- Conduct the final engineering evaluations of the remaining alternatives
- Draft and deliver the Revised Proposed Plan based on the conclusion of the FFS, Phase 2

4. Guidance Documents and Assumptions

The work described in this SOW will follow relevant CERCLA guidance documents for conducting a FS (e. g., EPA, 1988) to the extent required to provide an update to remedial investigations and focused feasibility studies that have already taken place. The iteration of the RI/FS process described in this SOW is intended to lead to a new or revised record-of-decision for the 300-FF-5 Operable Unit. As mentioned above, deviations

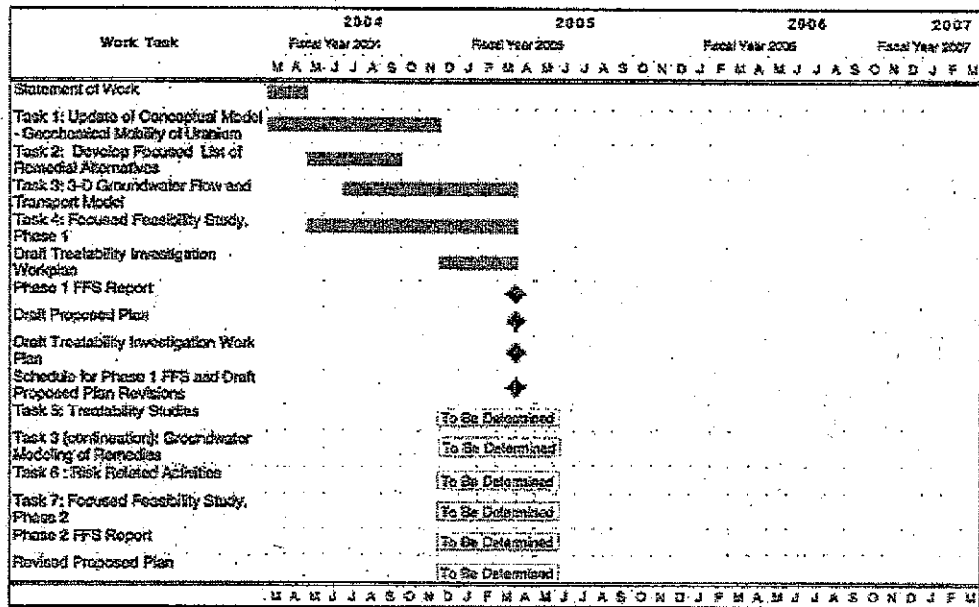
from the typical FS methodology will be necessary because of the operable unit's current stage in the CERCLA process.

5. Deliverables

- Statement of Work -- May 1, 2004 (approx. 10 pages, distributed via e-mail)
- Update of the 300-FF-5 Conceptual Hydrogeological Model -- December 1, 2004 (PNNL document; FY2004 requirement in the Operations and Maintenance Plan, DOE/RL-95-73, Rev. 1)
- Draft Focused Feasibility Study, Phase 1 -- March 31, 2005
- Draft Proposed Plan -- March 31, 2005
- Draft Treatability Investigation Work plan -- March 31, 2005
- Schedule for revising the Phase 1 Focused Feasibility Study and Draft Proposed Plan based on the results of the Treatability Investigation -- March 31, 2005
- Draft Treatability Studies Report -- TBD
- Focused Feasibility Study, Phase 2 -- TBD
- Revised Draft Proposed Plan -- TBD

6. Work Schedule

300 FF-5 Work Schedule Revision 1



7. References

DOE-RL, 1994, *Phase I Remedial Investigation Report for the 300-FF-5 Operable Unit*, DOE-RL-93-21 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL, 1994, *Phase I and II Feasibility Study Report for the 300-FF-5 Operable Unit*, DOE-RL-93-22 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL, 1995, *Remedial Investigation/Feasibility Study report for the 300-FF-5 Operable Unit*, DOE-RL-94-85 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL. 2002. *Operation and Maintenance Plan for the 300-FF-5 Operable Unit*. DOE/RL-95-73, Rev. 1, May 2002. Prepared by CH2M HILL Hanford, Inc. for U.S. Department of Energy, Richland, Washington.

Patton, G.W., S.P. Van Verst, B.L. Tiller, E.J. Antonio, and T.M. Poston. 2002. *Survey of Radiological and Chemical Contaminants in the Near-Shore Environment at the Hanford Site 300 Area*. PNNL-13692, September 2002. Pacific Northwest National Laboratory, Richland, Washington.

Serne, R.J., C.F. Brown, H.T. Schaefer, E.M. Pierce, J.W. Lindberg, Z. Wang, P.L. Gassman, and J.G. Catalano. 2002. *The 300 Area Uranium Leach and Adsorption Project*. PNNL-14022. Pacific Northwest National Laboratory, Richland, Washington.

USEPA, 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA – Interim Final*.

USEPA, 1996, *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington*.

USEPA, 2000, *Explanation of Significant Difference for the 300-FF-5 Record of Decision, June 2000*.

May 28, 2004
Draft

**STATEMENT OF WORK
FOCUSED FEASIBILITY STUDY/PRE-DESIGN
REMEDY FOR THE 618-10 AND 618-11 BURIAL GROUNDS, AND THE 316-4,
600-63, AND 600-259 SOURCE WASTE SITES AT GROUNDWATER
OPERABLE UNIT 300-FF-5**

1. Purpose

The Department of Energy has requested Pacific Northwest National Laboratory to complete the work described in this SOW in order to provide a technical basis for selection of a remedy for groundwater contamination in the subsurface of the 300-FF-5 Operable Unit. Once implemented, the remedy in conjunction with other actions outside of this SOW, such as, surface and near-surface source removal actions, will reduce the groundwater contamination concentrations in the operable unit.

The geographical scope of this statement of work is the 300-FF-5 Operable Unit and involves the groundwater associated with the 618-10 and 618-11 Burial Grounds, and the 316-4, 600-63 and 600-259 Source Waste Sites. Groundwater in other regions of the 300-FF-5 OU, particularly those contaminated by uranium, will be addressed by separate statement of work involving the 300-FF-5 Focused Feasibility Study. This work is focused on two main goals: 1) risk reduction and 2) restoration of the aquifer to its highest beneficial use.

Both of the work products resulting from this statement of work and from the statement of work for the uranium plume area of the 300-FF-5 Operable Unit will be reported jointly in the Draft FFS to be delivered on March 31, 2005.

2. Background of the 300-FF-5 Operable Unit

The scope of this work will differ from the typical Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) paradigm of a feasibility study (FS) as outlined in 40 CFR 300.430(e) because a Record-of-Decision (ROD) for the 300-FF-5 OU has already been established for interim remedial actions (EPA 1996 and EPA 2000). The following tasks, which would typically be completed in conjunction with an FS, have already been completed for the operable unit:

- Extensive site characterization, with notable milestones being the Remedial Investigation/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).

- Baseline risk assessment, as reported in the Remedial Investigation/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).
- Screening of a wide variety of remedial action technologies, Phase I and II Feasibility Study Report for the 300-FF-5 Operable Unit (DOE-RL-93-22), assembling of remedial alternatives, and detailed analysis of remedial alternatives, Remedial Investigations/Feasibility Study for the 300-FF-5 Operable Unit (DOE-RL-94-85).
- Consideration of applicable or relevant and appropriate requirements (ARARs), Remedial Action Objectives (RAOs) and Preliminary Remediation Goals (PRGs) presented in DOE-RL-94-85.
- Selection of an interim action remedy in the ROD (EPA, 1996; modified by an Explanation of Significant Difference in June 2000 to include the groundwater beneath the 618-10, 618-11, 316-4, 600-63 and 600-259 sites).

3. Task Elements

Task 1 – Update of 300-FF-5 Conceptual Model and Conduct Risk Assessments for the Five Sites (Peterson, Lindberg)

- Review groundwater monitoring data associated with the 618-10 and 618-11 Burial Grounds and the 316-4, 600-63 and 600-259 Source Waste Sites and establish trends in data. This analysis will collate data reported in the annual Hanford Site Groundwater Monitoring reports, such as, PNNL-14548, 2004. Conduct risk assessments based on contaminant concentrations found in groundwater associated with the five sites.

Task 2 – Evaluate Contaminant Transport Potential with Modeling Techniques

- Individual occurrences of contamination will be evaluated separately using modeling techniques suited to the available database in order to assess the migration potential of contaminants.

Task 3 (If necessary) – Develop Focused List of Alternatives for Evaluation (Nimmons, Naymik, and Peterson)

- The objective of this task is to identify and evaluate a limited set of remedial alternatives that may be effectively deployed to remedy any groundwater contamination associated with the five waste sites identified in this scope of work.

Task 4 (If necessary) – Focused Feasibility Study (Nimmons)

- Based on monitoring results and engineering evaluations prepare a technical description and conceptual layout of the final focused alternatives.

- Conduct the final engineering evaluations of the remaining alternatives.
- Prepare a focused feasibility study comparing and ranking the remaining remedial alternatives to select a remedy according to the nine NCP criteria.
- Draft and deliver the Revised Proposed Plan based on the conclusion of the Focused Feasibility Study.

4. Guidance Documents and Assumptions

The work described in this SOW will follow relevant CERCLA guidance documents for conducting a FS (e. g., EPA, 1988) to the extent required to provide an update to remedial investigations and focused feasibility studies that have already taken place. The iteration of the RI/FS process described in this SOW is intended to lead to a new or revised record-of-decision for the 300-FF-5 Operable Unit. As mentioned above, deviations from the typical FS methodology will be necessary due to the operable unit's current stage in the CERCLA process.

5. Deliverables

- Statement of Work – May 1, 2004 (approx. 2 pages, distributed via e-mail)
- Update of the 300-FF-5 Conceptual Hydrogeological Model and Risk Assessments – December 1, 2004 (PNNL document; FY2004 requirement in the Operations and Maintenance Plan, DOE/RL-95-73, Rev. 1)
- Focused Feasibility Study (Results of this work will be reported jointly in the Draft FFS of the uranium plume Area) – March 31, 2005
- Draft Proposed Plan (If actions are necessary for the areas addressed in this SOW they will be included in the Draft Proposed Plan of the uranium plume area) – March 31, 2005

6. Schedule

The scheduling and performance of this work will closely parallel similar activities in the separate statement of work involving the uranium plume area, 300-FF-5 Focused Feasibility Study.

7. References

DOE-RL, 1994, *Phase I Remedial Investigation Report for the 300-FF-5 Operable Unit*, DOE-RL-93-21 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL, 1994, *Phase I and II Feasibility Study Report for the 300-FF-5 Operable Unit*, DOE-RL-93-22 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL, 1995, *Remedial Investigation/Feasibility Study report for the 300-FF-5 Operable Unit*, DOE-RL-94-85 Revision 0, U. S. Department of Energy, Richland, Washington.

DOE-RL, 2002. *Operation and Maintenance Plan for the 300-FF-5 Operable Unit*. DOE/RL-95-73, Rev. 1, May 2002. Prepared by CH2M HILL Hanford, Inc. for U.S. Department of Energy, Richland, Washington.

PNNL-14548, 2004. *Hanford Site Groundwater Monitoring for Fiscal Year 2003*. Pacific Northwest National Laboratory.

USEPA, 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA – Interim Final*.

USEPA, 1996, *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington*.

USEPA, 2000, *Explanation of Significant Difference for the 300-FF-5 Record of Decision, June 2000*.